

Appl. No. 10/581,405
Reply to Office Action of October 19, 2009
Amdt. Dated January 19, 2010

DRAWING AMENDMENTS

Three replacement drawing sheets have been provided. Changes have been made to Figs. 1, 4, and 6.

Attachments: Three Replacement Sheets
 Three Annotated Sheets Showing Changes

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REMARKS

Reconsideration of the application is requested.

Claims 1-18 remain in the application. Claims 1-8 are subject to examination and claims 9-18 have been withdrawn from examination. Claims 1-8 have been amended.

Applicant appreciates the time and effort of the Examiner in indicating the various informalities so that they could be corrected.

On page 2 of the above-identified Office Action, the Examiner objected to the drawings under 37 CFR 1.184 (p)(4).

The drawings and the specification have been amended to refer to the Plexiglas box using reference character 116 rather than 16. The drawings and the specification have been amended to refer to the sealing ring using reference character 136 rather than 36.

On page 2 of the above-identified Office Action, the Examiner objected to the drawings under 37 CFR 1.184 (p)(5).

Fig. 4 has been replaced with a figure in which the features and the reference characters can be seen more easily. Reference character 44 has been deleted from Fig. 6.

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With regard to the comment about a middle section of a figure being blurry, applicant assumes that the Examiner is referring to Fig. 4, which has been replaced.

On page 3 of the above-identified Office Action, the Examiner objected to the disclosure.

The specification has been amended and reference character 14 is no longer used in connection with the optical fiber.

The Examiner has stated that applicant has not defined the composition of optical cement. Applicant believes that the compositions of various optical cements or glues are well known and that the teaching in the specification is clear to one of ordinary skill in the art.

On page 3 of the above-identified Office Action, the Examiner objected to the specification as failing to provide proper antecedent basis for the claimed subject matter.

The Examiner stated that the subject matter of claim 5 is not found in the specification. Applicant believes that clear support is found for the features of claim 5. See page 3, lines 1-26 and page 4, lines 1-15, for example.

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Applicant has deleted the term "third component" from the claims since that actual term is not found. The binder characteristic is now defined in claim 6 rather than in claim 5.

On page 4 of the above-identified Office Action, the Examiner objected to claims 2 and 6 because of informalities. The Examiner indicated that sulfide is misspelled.

Claims 2 and 6 have been amended to correct the spelling of sulfide.

Under the heading "Claim Rejections – 35 USC § 112" on page 4 of the above-identified Office Action, claims 6-8 have been rejected as being indefinite for failing to particularly point out and distinctly claim the subject matter under 35 U.S.C. § 112, second paragraph.

Applicant believes that the compositions of various optical cements or glues are well known and that the teaching in the specification is clear to one of ordinary skill in the art.

It is accordingly believed that the claims meet the requirements of 35 U.S.C. § 112, second paragraph.

The above-noted changes to the claims are provided solely for clarification or cosmetic reasons. The changes are neither provided for overcoming the prior

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art nor do they narrow the scope of the claim for any reason related to the statutory requirements for a patent.

Under the heading "Claim Rejections – 35 USC § 102" on page 4 of the above-identified Office Action, claims 1,2 and 5 have been rejected as being fully anticipated by U.S. Patent No. 5,126,573 to Knuepfer et al. under 35 U.S.C. § 102.

Claims 1 - 8 have been amended to better define the invention. Claims 1 and 5 now define a sensor head for measuring a penetration depth of a proton beam in tissue. The sensor head includes the defined inorganic scintillating mixture. Support for the changes can be found, for example, by referring to page 3, lines 1-26, page 6, lines 28-35 of the specification.

The invention as now defined by claims 1 and 5 is not taught by Knuepfer et al. Knuepfer et al deals with X-ray image intensification, however the invention relates to quiet different particle beam radiation depth measurement. Clearly, Knuepfer et al. do not teach anything related to a sensor head for measuring a penetration depth of a proton beam in tissue.

In particular, with the application of proton beam radiation which is broadly used in cancer proton beam therapy, the scintillation mixture as claimed has a very sharp quenching characteristic when the proton beam comes to a stop at the so-called Bragg peak. The Bragg peak thereby is the depth in the human

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tissue where the proton-tissue interaction causes the maximal biological damage to the cells although the proton beam dies out at the end of its penetration path in the tissue. Therefore, a proton beam is used to place its most tissue destroying impact exactly at the depth of the Bragg peak. The currently claimed scintillation mixture has, in a completely unexpected manner, a particular quenching property that shows an extremely high scintillation light gain in the range of the Bragg peak therefore requiring only very little intensities to measure the depth of the Bragg peak (the range of the protons at maximal biological damage).

The measurements relating to the depth of the proton beam are extremely sensitive since the depth of the Bragg peak should be known precisely when planning the radiation strategy for a distinct type and form of a malicious cancer volume in surrounding healthy tissue or other vital parts of the human body, such as a spinal cord, brain, neurocytes and the like.

Applicants believe the invention as defined by claims 1 and 5 is not taught by Knuepfer et al.

Under the heading "Claim Rejections – 35 USC § 103" on page 5 of the above-identified Office Action, claims 3 and 4 have been rejected as being obvious over U.S. Patent No. 5,126,573 to Knuepfer et al. under 35 U.S.C. § 103.

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Applicants believe the invention as defined by claims 3 and 4 would not have been suggested for the reasons given above with regard to claim 1.

Under the heading "Claim Rejections – 35 USC § 103" on page 5 of the above-identified Office Action, claims 6-8 have been rejected as being obvious over U.S. Patent No. 5,126,573 to Knuepfer et al. in view of U.S. Patent No. 4,455,323 to Ishizuka et al. under 35 U.S.C. § 103.

Applicants believe the invention as defined by claims 6-8 would not have been suggested for the reasons given above with regard to claim 5.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claims 1 or 5. Claims 1 and 5 are, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 1 or claim 5.

In view of the foregoing, reconsideration and allowance of claims 1-8 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out.

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Please charge any fees that might be due with respect to Sections 1.16 and
1.17 to the Deposit Account of Lerner Greenberg Sterner LLP, No. 12-1099.

Respectfully submitted,

/Mark P. Weichselbaum/
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MPW:cgm

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